

REMARKS

Claims 1-18 and 23-29 are pending in the application. Claims 19-22 were withdrawn from consideration by Applicants in response to the Office Action of May 4, 2001. Claims 1-18 and 23-29 stand rejected under the Office Action of May 24, 2002.

Claims 1-6, 8-13, 15-18, 28, and 29 were rejected under 35 U.S.C. §102(b) as being anticipated by the book "Computer Graphics Principles and Practice" by Foley et al. Specifically, claims 1, 2, 4-6, 8-11, 13, 15-18, and 28 were also rejected as being anticipated by Foley et al. at pages 736-737 which describes Gouraud shading. Claims 3 and 29 were rejected as being anticipated by Foley et al. for disclosing perspective interpolation. Claim 12 was rejected as being anticipated by Foley et al. for using depth values of the first and second points to determine an interior point. Further, claims 1, 3-18, and 23-29 were also rejected as being anticipated by Spackman (U.S. Patent No. 5,739,818). In view of the above amendments and following remarks, Applicants respectfully request reconsideration of the application.

Rejections Under 35 U.S.C. §102(b)

In paragraph 3 of the Office Action, the Examiner rejected independent claim 1 as being anticipated by Foley et al. In the book "Computer Graphics Principles and Practice," Gouraud shading is described. The Examiner rejected claim 1 as being

anticipated by this reference. The amendment presented herewith amends claim 1 to render it patentably distinguishable from that of the cited reference.

The amendment provides that the Applicants' claimed invention receives "...a signal from an interface, the signal comprising data about a plurality of vertices of the primitive and an independent variable." As described in the specification, the data or information is received by agents from an application programming interface (API). The API sends signals to agents within an interpolation system which contains data used by the interpolation engine (as included in claim 1 by amendment) to calculate channel values for various points in a primitive (page 19, lines 21-25 of the specification). This is patentably distinguishable from the prior art as Foley et al. does not disclose an interpolation engine, a system for interpolating the channel values as claimed by the Applicants, or, most importantly, "...receiving a signal from an interface, the signal comprising data about a plurality of vertices of the primitive and an independent variable." Thus, Applicants request withdrawal of the rejection and submit that claim 1 is in condition for allowance. Further, Applicants submit that the Examiner's rejections of claims 2-6, 28, and 29 are also overcome for the same reasons as claim 1. Applicants therefore request the withdrawal of these rejections as these claims are also in condition for allowance because they depend from allowable claim 1, as discussed above.

The Examiner also rejected claims 8-11, 13, and 15-18 for similar reasons as claim 1. Pursuant to the amendments herein, Applicants submit that independent claims 8, 9, 13, and 15 are also in condition for allowance for similar reason as those set forth above for claim 1. Similar amendments distinguishing the Applicants' claimed invention over the cited reference place these claims in condition for allowance. Further, as claims 10-12 and 16-18 depend from claims 9 and 13, respectively, these claims are also in condition for allowance for similar reasons as those discussed above.

The Examiner also rejected claims 3 and 29 as being anticipated by Foley et al., stating that “[T]hese claims claim performing perspective interpolation. This is taught by the z-buffering technique described by Foley....” Again, Applicants submit that these claims are allowable. Despite the Examiner's rejection based upon the z-buffering technique of Foley et al., as claims 3 and 29 depend from claim 1, these claims are also in condition for allowance for similar reasons as those stated above.

Claim 12 was specifically addressed and rejected by the Examiner as anticipated by Foley et al. because “[T]his claim claims using depth values of the first and second points to determine the interior point. This is taught by the z-buffering technique described by Foley....” Again, a similar amendment to claim 9 whereby the method receives “...a signal from an interface, the signal comprising data about the plurality of vertices of the primitive and an independent variable” patentably distinguishes the

claim as well as those that depend from it, claims 10-12, from the cited reference. Thus,

Applicants submit that claim 12 is also in condition for allowance.

In paragraph 4, page 3 of the Office Action, the Examiner also rejected claims 1, 3-18, and 23-29 under 35 U.S.C. §102(b) as being anticipated by Spackman (U.S. Patent No. 5,739,818). The Examiner stated that Spackman "...describes interpolation of texture data and specifically describes perspective interpolation." However, the Applicants' claimed invention is patentably distinguishable from Spackman.

The amendments submitted herewith patentably distinguish the Applicants' claimed invention from Spackman as the cited patent does not disclose receiving data from an interface. In fact, Spackman specifically discloses receiving "...data from the projector 50, defining each polygon in terms of its vertices." (column 4, lines 54-55). Spackman does not disclose an interface as claimed by Applicants, or an application programming interface, as further described by Applicants in the specification of the claimed invention. The Examiner states, in rejecting claim 14, that "[E]ach part of Spackman that enables the equations and that receives vertex data is the claimed *agent*. The part that feeds the vertex data to the interpolation equations is an *arbiter*. The part that sends calculated results that are reused in the interpolation equation is the *router*" (emphasis added). However, Spackman does not disclose "a plurality of agents configured to receive information *from an interface* related to the plurality of vertices and

generate output signals." As amended, claim 14 is allowable in light of the above explanation.

Thus, given the amendments to independent claims 1, 8, 9, 13, 14, 15, 23, and 27, Applicants submit that these claims are in condition for allowance. Further, as claims 2-7 and 28-29 depend from claim 1, claims 10-12 depend from claim 9, claims 16-18 depend from claim 15, and claims 24-26 depend from claim 23, these claims are also in condition for allowance.

Conclusion

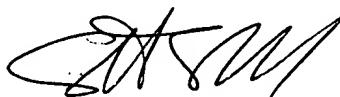
Based on the above amendments and remarks, Applicants submit that the rejections in the Office Action are fully overcome and that the application is in condition for allowance and a Notice of Allowability is respectfully requested. If the Examiner has questions regarding the case, the Examiner is invited to contact Applicants' undersigned representative at the number given below.

Respectfully submitted,

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Version with Markings to Show Changes Made

IN THE CLAIMS

The same-numbered pending claims have been amended as follows:

1. (Third amendment) In a graphics system, a computer-implemented method of rendering a graphic primitive, the graphic primitive having a plurality of sides that define the edge of the primitive, the method comprising:

receiving a signal from an interface, the signal comprising data about a plurality of vertices of the primitive and an independent variable;

determining a channel value for each of the plurality of vertices of the primitive using the data about the plurality of vertices and the independent variable;

selecting an interior point within the graphic primitive;

selecting at least two side points located on a side of the graphic primitive;

determining an interpolated channel value with an interpolation engine for each of the at least two side points; and

determining a channel value at the selected interior point by interpolation from the interpolated channel values of each of the at least two side points.

8. (Third amendment) An electronically-readable medium storing a program for permitting a computer to perform a method comprising:

receiving a signal from an interface, the signal comprising data about a plurality of vertices of the primitive and an independent variable;

determining a channel value for each of the plurality of vertices of the primitive using the data about the plurality of vertices and the independent variable;

selecting an interior point within the graphic primitive;

determining an interpolated channel value with an interpolation engine for each of at least two side points; and

determining a channel value at the selected interior point by interpolation from the interpolated channel values of each of the at least two side points.

9. (Amended) A method of rendering a graphic primitive, the primitive including a plurality of edges, the method comprising:

receiving a signal from an interface, the signal comprising data about the plurality of vertices of the primitive and an independent variable;

deriving a channel value of a first point on a first edge of the graphic primitive using data about the plurality of vertices of the primitive and an independent variable;

deriving a channel value of a second point on a second edge of the graphic primitive using data about the plurality of vertices of the primitive and an independent variable; and

based upon the channel values of the first point and the second point, determining a channel value for an interior point located within an interior surrounded by the edges of the graphic primitive.

13. (Amended) An electronically-readable medium storing a program for permitting a computer to perform a method comprising:

receiving a signal from an interface, the signal comprising data about a plurality of vertices of a primitive and an independent variable;
deriving a channel value of a first point on a first edge of the [a] graphic primitive using data about the plurality of vertices of the primitive and an independent variable;

deriving a channel value of a second point on a second edge of the graphic primitive using data about the plurality of vertices of the primitive and an independent variable; and

based upon the channel values of the first point and the second point, determining a channel value for an interior point located within an interior surrounded by the edges of the graphic primitive.

14. (Amended) A system for rendering a graphic primitive, the graphic primitive including a plurality of vertices and edges, the system comprising:

a plurality of agents configured to receive information from an interface related to the plurality of vertices and generate output signals;

an arbiter coupled to the plurality of agents and configured to receive the output signals and to generate request signals;

an interpolation engine configured to receive the request signals and generate an output ratio signal dependent on at least some of the output signals from the plurality of agents; and

a router coupled to the interpolation engine and configured to transmit the output ratio signal to an input of at least one of the plurality of agents.

15. (Third amendment) A system for rendering a graphic primitive in a graphics system, the graphic primitive having a plurality of sides, the system comprising:

 a channel value input device configured to determine a channel value for each of a plurality of vertices of the graphic primitive using data received from an interface;

 a point specifier, coupled to the channel value input device, configured to select a point within the graphic primitive; and

 an interpolation engine coupled to the point specifier and to the channel value input device, configured to determine an interpolated channel value for each of at least two side points using data received from the interface, and further configured to determine a channel value at the selected point by interpolation from the interpolated values.

23. (Amended) A method of generating interpolated values for use in rendering a graphic primitive, the method comprising:

receiving from an interface an independent variable X representing the physical portion of a point;

receiving vertex values X0, X1 of a primitive edge having the point with the physical position represented by the independent variable X;

receiving depth values Z0, Z1 associated with the vertex values X0, X1; and

calculating a ratio value dependent upon the independent variable X, vertex values X0, X1, and depth values Z0, Z1.

27. (Amended) An electronically-readable medium storing a program for permitting a computer to perform a method of generating interpolated values for use in rendering a graphic primitive, the method comprising:

receiving from an interface an independent variable X representing the physical position of a point;

receiving from the interface vertex values X₀, X₁ of a primitive edge having the point with the physical position represented by the independent variable X;

receiving from the interface depth values Z₀, Z₁ associated the vertex values X₀, X₁; and

calculating a ratio value dependent upon the independent variable X, vertex values X₀, X₁, and depth values Z₀, Z₁.